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FILE # 997164

Approved For Release 2005/02/17 : CIA-RDP78B04770A001000030050-4

NPIC/P&DS/D/6-1315

20 April 1966

MEMORANDUM FOR: Chief, Contracts Division, OSA/DD/S&T

ATTENTION:

SUBJECT:

Time Extension for Contract

1. It is requested that contract be extended for a year commencing 1 July 1966 to 30 June 1967. This action will be in accordance with provisions of the original contract which specifies extension by mutual agreement on a year-to-year basis as projects exist and funds are available.

2. Nine PARs are currently active and will continue into FY 1967:

PAR 201 Travel and Liason.

PAR 214 Reversal Processor (formal acceptance by NPIC will complete this PAR.)

PAR 215 24-Inch Paper Processor (nearing completion; formal acceptance of the model will complete this project.)

PAR 233 Zoom (6x to 60x) Projection Lens.

PAR 238 Equipment Installation (nearing completion.)

PAR 239 Administration.

PAR 243 Briefing Print Enlarger Prototype.

PAR 244 Spare Parts for RT Processors.

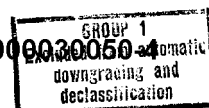
PAR 245 BPE Lenses, 60x to 160x.

3. The time extension request does not involve increased funding. FY 1964-1965 appropriations for contract remain at a total of

Declass Review by NGA.

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[] the total estimated cost of completed and uncompleted projects is [], leaving a balance [] to cover contingencies.

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Colonel, USAF
Assistant for Plans and Development, NPIC

Distribution:

Original and 1 - Addressee

1 - []
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1 April 1966

Dear Ed,

We have recently completed evaluations of four more [] final reports under [] PARs 212, 213, 216, and 217. I have enclosed the evaluations for your information.

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I had mentioned in my letter to you on 3 January that I would forward comments on the final reports of PARs which we have received during past months. My summary of [] PARs now lists them as follows:

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PAR 207 "Definitive Study of Contact Printers".

Active. Final report not yet received.

PAR 211 "Microdensitometer Study of Effects of Processing".

Completed. This was the subject of my 3 January letter.

PAR 212 "Color Acquisition System Review Study". (Encl. #1)

PAR 213 "Color Reproduction Systems Review". (Encl. #2)

PAR 216 "Laser Photographic Exposure". (Encl. #3)

PAR 217 "Optimization of Lasers". (Encl. #4)

PAR 233 "Zoom Projection Lens (6x to 60x)".

Active. Work had begun on this project in the form of an initial feasibility study, but has since been discontinued until NPIC reviews the effect of the low optical transmittance on over-all system performance.

PAR 242A "Color Demonstration Materials".

Completed. Delivery of materials took place in March.

PAR 243 "Briefing Print Enlarger Prototype".

Active. This is the follow-on from PARs 202/224. This project has great prospects and would fulfill community requirements at the present time.

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PAR 214 "Reversal Processor".

Active. Installed at NPIC and now being tested and evaluated.

PAR 215 "24-Inch Paper Processor".

Active. Installed at NPIC and now being tested and evaluated.

In addition to those PARs listed, you are presently preparing a new proposal, PAR 245, to fill a new requirement: a separate lens system to fit the BPE (PAR 243) to cover ranges 60x to 160x.

I have received your response to my 3 January letter concerning PAR 211. I assure you that I have taken every measure to guard proprietary rights.

My purpose in forwarding copies of these evaluations is to give you an insight into our present method of providing studied evaluations to certain R&D projects affecting NPIC.

The four enclosed evaluation PARs and require no further action.



Enclosures:

- 1 - Evaluation of Final Rpt. PAR 212
- 2 - Evaluation of Final Rpt. PAR 213
- 3 - Evaluation of Final Rpt. PAR 216
- 4 - Evaluation of Final Rpt. PAR 217

Prepared by: (3 March 1966)

Bidtribution:

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13 January 1966

EVALUATION OF FINAL REPORT ON PAR 212

Background

1. Title of PAR 212: Color Acquisition Systems Review Study.
2. The objectives of PAR 212 was to "investigate color photography as a possible anticipated intelligence medium. Investigation should cover the capability of present and possible future acquisition systems in an attempt to predict future requirements to support exploitation and data reduction of the collected color photographic intelligence material."
3. This PAR was begun on March 1964. The final report dated 15 July 1965 was received 1 November 1965. Four briefing boards were also delievered. Total cost to the Government

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Evaluation

1. The contractor performed an adequate job on this project if allowance is made for the poor definition of the project objectives. The contractor has compiled in the final report much of the basic knowledge which is now available concerning the various parameters of color acquisition, particularly from high altitudes. The report discusses: (a) the types and characteristics of color films suitable for reconnaissance (However, it does not consider other than); (b) lens and filter requirements; (c) effects of haze with respect to vehicle altitude and solar altitude; (d) viewing conditions with respect to magnification and stereo. (The final report on PAR 213 has a more comprehensive section on viewing color materials.) It would have been more apropos to have included the section on viewing requirements in the PAR 212 report than in the PAR 213 report which essentially was a study of reproduction techniques.

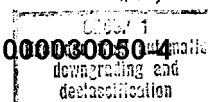
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2. Much of the final report on PAR 212 duplicates and augments the final report on PAR 213 (Color Reproduction Systems Review). Much of the duplicative material is necessary in each report because the conditions which affect color acquisition have a great bearing on methods and materials used in color reproduction. With hindsight now available, it would have been more efficient and more useful to have combined these two projects and to have produced a "color acquisition, reproduction, and viewing manual" in one volume. As it now stands, it is recommended that both reports (PAR 212 and 213) be used in conjunction with each other.

(Enclosure #1)

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EVALUATION OF FINAL REPORT ON PAR 213

A. BACKGROUND

1. In view of the potential of color photography playing an important role in the intelligence community, [redacted] was given the task of investigating and determining the most suitable means to reproduce and utilize multiple copies of color materials. Included in this broad task were specific tasks as follows: (a) Determination of the most suitable materials for color reproduction systems, (b) Types of equipment to be used in all phases of the reproduction cycle, (c) Define how color photography can best be utilized by the photo interpreter.

2. Work on this project began on 6 December 1963 and was completed, with the final report dated 15 April 1965, at a cost to the Government of [redacted]

B. EVALUATION

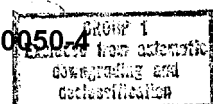
1. The first impression gained from the final report is that [redacted] has performed an adequate job in reporting on color reproduction systems. However, when analyzing the basic task which, is to "INVESTIGATE AND DETERMINE THE MOST SUITABLE REPRODUCTION SYSTEMS", it is obvious that this project has not yielded the maximum information regarding exploitation of color materials.

2. Based on the results of their study, [redacted] has recommended: (a) The use of SO-121 material where high contrast is desired in the reproduced transparency, (b) The use of SO-271 for a medium contrast transparency reproduction, and (c) Type SO-344 for a low contrast transparency reproduction material. Although the evaluations performed by [redacted] substantiate these recommendations, the evaluations were limited to [redacted] products only. It is possible that other manufacturers' color products could have applied to many of these reproduction requirements. Although [redacted] is likely to favor their own products, there is no indication, in the final report, that other products had been given consideration.

3. A portion of this program involved a study of printing techniques including additive and subtractive printing methods. The information and block diagrams on this subject, were presented in an excellent manner, however, these techniques are not new and can be found in published texts dealing with color printing methods.

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(Enclosure #2)



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4. Significant information on stereo viewing of color materials resulted from the study. Due to the resolution limits of present color acquisition materials, the practicality of viewing color transparency material from high altitude missions is extremely limited. Additionally, the original material, SO-121, due to high altitude haze conditions, is of very low contrast and lacks color saturation. The contrast and color saturation can be greatly improved by contact dupe printing on to the same material, SO-121. For stereo viewing of high altitude materials, the best results can be obtained by using the dupe positive in conjunction with a positive produced from a B&W 3404 type acquisition film, exposed simultaneously with the original SO-121 color material. When viewing this B&W/color stereo pair, a medium color saturation is seen with excellent sharpness. This effect is obtained by the inherently sharper black and white positive plus the color signatures from the high contrast color dupe. It is worth noting that to gain the maximum advantage of viewing a black and white/color stereo pair, requires the insertion of a neutral density filter over the black and white side. This technique subdues the black-and-white image brightness (but not the sharpness) thereby increasing the apparent color saturation of the stereo image. To avoid handling neutral density filters, the use of a polarizing system in each optical path would simplify stereo viewing systems.

25X1 5. The following materials have been recommended for particular features in the reproduction systems:

(a) Transparency Positives - Contact Dupes:

- (1) Type SO-121 - A high contrast, relatively high resolution material - excellent for reproduction of low contrast, low saturation, original high altitude materials.
- (2) SO-271 - A medium contrast product having lower resolution than SO-121.
- (3) SO-344 - High resolution, low contrast product - excellent for color copies of low altitude acquisition.

(b) Internegative Materials - Two internegative materials are recommended as an intermediate stage in producing contact and enlarged hard copy color prints.

- (1) Internegative film type 5270 is the best medium for contact printing from the color original to produce hard copy enlargements. It has excellent resolution and color fidelity characteristics.
- (2) Ektacolor internegative film is recommended for enlarging directly from the original. Due to its low resolution characteristics this medium is not practical in contact printing from the original acquisition material.

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(Enclosure #2, continued)

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(c) Print Materials:

(1) Ektacolor Print Film is recommended to produce enlarged print transparencies from either of the two internegative materials. This product has excellent color fidelity but is resolution limited.

(2) Ektacolor professional print paper is recommended for enlarged reflection color prints produced from either of the two internegative materials.

6. Equipment recommendations: Based on the study, [] has attempted to specify the type of printing, processing and viewing equipment needed for the exploitation of color materials. Most of their recommendations are broad in nature with no specific design possibilities stressed. They recommend investigation into the use of a modified Niagara or Colorado type printer for continuous contact printing. Also, that we should try and utilize the tri-color (narrow band filter) technique in the development of any color printers. This technique as stressed in this report has been proven to produce a superior product over the white light (color compensating filter) technique. It is worth noting that the approved "breadboard" of the briefing print enlarger (BPE), although primarily a black and white printer, has color printing capabilities utilizing the tri-color technique. Another worthwhile consideration, by [] is a variable area, intensity, and color balance transparency viewer, capable of handling long lengths of film, 70mm to 9.5 inches wide, and having a viewing area at least 30 inches long.

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7. Summary: Although [] has done a fine job in reporting on [] film and print materials for reproduction systems, the task of reviewing color materials for exploitation systems is not complete until other manufacturers' comparable products have been evaluated. Also the reproduction method of positive-to-positive (transparency-to-reflection print) directly has not been discussed in the review at all. Until these tasks have been completed, it would be unwise to commit ourselves on any specific color equipment development program. We should, however, keep in mind for future development products, the following: (a) A stereoscope with individual polarizing eyepieces for B&W/color stereo pairs, (b) The modification of a Niagara type printer for a continuous contact color printer, (c) Tri-color printing method or techniques-to be employed in all type color printers, (d) A color transparency viewer with variable area, intensity, and color balance capabilities.

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EVALUATION OF FINAL REPORT ON PAR 216

Background

25X1 PAR 216 of Contract [] posed the problem of studying the effects of lasers on photographic materials and techniques. Its broad objective was to discern and define the similarities and the discrepancies between the use of lasers and the use of conventional, non-coherent light sources in the photographic processes. [] undertook the problem on 6 February 1964 and completed the work on 15 January 1965 at a cost to the Government of [] Three basic study areas were to be investigated: (1) film response and resolution, (2) effects of heat, and (3) photographic processing. (Optimization of the laser will be considered under PAR 217.) The final report includes both findings and recommendations in response to our submitted request for research.

Evaluation

25X1 1. Probably the simplest way in which to appraise the final report, and indeed the entire study program, would be to separate the successes from the failures, the desired ends achieved from the desired ends neglected. Specific questions posed in our detailed research objective should have provided [] with a framework from which to organize their work.

25X1 2. Beginning with the area of film response and resolution, the broadly stated objective was the determination of the manner in which present and predictable future high resolution films are responsive to light energy in red and near infrared ranges. Specifically, any unique resolution characteristics were to be investigated and compared with shorter wavelength exposure. Nowhere in the final report is any mention made of attacking this problem. [] has given us some verbal assurances that there are no real problems in this area--that film responds to red and near infrared light much the same as it does to white light. However, [] has not provided substantive data to confirm these verbal assurances. Their primary effort was a comparison of coherent and non-coherent radiation, surely a valid consideration when approaching lasers, but only a partial one. Since lasers are, to date, found predominantly in the red end and not in the actinic end of the spectrum, such a requirement should have been treated in some detail. Any implications of resolution differences would have been most crucial to future film development. The contractor regarded only radiation of the "same approximate wavelength and energy level." Although we suggested emphasis at one wavelength of especial interest, that of the laser enlarger, this stipulation should not have been totally confining.

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(Enclosure #3)

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3. A second specific objective was to determine the effects upon resolution of the interference phenomena resulting from diffractions caused by the interaction of lasers' coherent beam and a turbid media such as a silver halide emulsion. Other than mentioning that "if the light is coherent there will be interference fringes," [] defines no quantitative aspects of this problem. Their use of a periodic photographic input (a scaled rule) in conjunction with this objective was a poor procedure since spurious focusing effects obtained from such repetitive images void any results obtained. Their contention that dust and scratches or any other foreign particles in the beam will cause problematical diffraction patterns is certainly valid; however, this is not news.

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4. The second broad goal of PAR 216 was a definition of the effects, if any, of laser-generated heat upon photographic film. Verbal assurance that heat would not play a significant role was received from [] however, they neither confirmed nor obviated any such concern in their final report. Specific questions involving film dimensionality and plasticity alteration and increased rates of emulsion deterioration were ignored. Although undoubtedly difficult to attain experimentally, quantitative answers are sorely needed if we are ever to promote lasers in photographic systems.

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5. The third and final broad area delineated was that of the photographic processing of laser-exposed materials--the determination of whether or not new and different processing techniques must be employed for films exposed with coherent radiation. [] treatment of this particular topic was somewhat more substantial than those previously mentioned. They investigated the possibilities of a difference in gamma existing between similarly exposed emulsions, one with coherent light, the other with non-coherent light. Their findings of no significant gamma discrepancy apparently led to the conclusion that special processing is not necessary for lasered photo-emulsions, although such reasoning is not explicitly confirmed in the final report.

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6. In all, this project must be appraised as quite inadequate in both design and experimental procedure. Its results, as reflected in the report, are too meager to have merited the time and funds allotted. In addition to substantially oversimplifying the stated objectives, the contractor has shown virtually no evidence of any awareness of related research being performed outside his own facilities. Only as an afterthought in the final report is any mention made of supportive literature, and nowhere has any imagination been exhibited in relation to future developments in the field of laser photography. In conclusion it must be judged that [] work on PAR 216 has not been particularly beneficial to the state-of-the-art or to the Government.

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